REMARKS

Claims 1-36 are presently pending in the application. Pursuant to the Office Action mailed June 1, 2006, the undersigned wishes to present the following remarks.

REJECTION UNDER 35 U.S.C. § 103

Claims 1-3, 5-8, 10-17, 19-30 and 33-35 stand rejected under 35 USC 103(a) as being unpatentable over Paine et al. (U.S. Pat No. 5,614,305; hereinafter "Paine") in view of Derwent-1994-086773 "bonding material for electronic appts." (hereinafter the "SMA Reference", which will be noted corresponds to published Japanese Application 6-36613). The Examiner cited the primary reference (Paine et al.) as teaching the basic claimed invention, but failing to teach the aspect that the composition could include SMA particles. The Examiner cited the SMA Reference as teaching the use of SMA particles. The Examiner concluded that it would have been obvious to combine the teachings of the SMA Reference to the resultant matrix taught by Paine et al. to produce enhanced paints with SMA particles.

Claims 4, 18, 30, 31, 32, 9 and 36 were rejected under 35 USC 103(a) as being unpatentable over the SMA Reference and Paine et al., as applied to Claims 1-3, 5-8, 10-17, 19-30, 33-35, and further in view of Chiou et al. (U.S. 5,369,163; hereinafter "Chiou et al."). These rejections are respectfully traversed.

Initially, it will be noted that Paine et al. has been discussed at length in previous responses. Nevertheless, a very brief summary will be provided concerning Paine et al. Paine et al. is directed to a multi-layer stack of polymer plys that are reinforced with SMA fibers. This is shown in Figure 2, wherein the SMA fibers are designated by reference numeral 8. Paine et al. does not make any mention of using SMA "particles",

but only of using SMA "fibers" in a construction of a multi-layer polymer composite material. Furthermore, Paine et al. in no way suggests the desirability, or provides any motivation, with regard to using SMA particles, or even SMA fibers in a composition such as a paint or a protective coating. In fact, if anything, it would appear that the use of SMA particles, rather than continuous SMA fibers, in the multi-layer stack of polymer plys that Paine et al. is involved with, would actually tend to weaken the multi-layer stack of polymer plys, when compared to the strength that would likely be obtained with continuous length SMA fibers.

THE "SMA REFERENCE" (JP 6-36613)

Overview

To address the issue with the SMA Reference, it is important to understand that shape memory alloys (SMAs) are utilized in applications by exploiting one of two possible, but distinctly different, properties of these alloys:

1. SMAs can exhibit what is called the "shape memory effect" (SME): utilizing temperature (heating) to induce a dimensional or shape change in the alloy (without a force - that is, without applying any stress to the alloy). "Shape memory effect" is the typical technical terminology used by metallurgists to describe this phenomena of SMAs.

2. SMAs can also exhibit the "superelastic effect" (SE): in this case force is applied to induce a dimensional or shape change, which can be reversible, once the force (stress) is eliminated. This occurs at a constant ambient temperature and never requires a temperature change (heating or cooling). The superelastic effect is achieved by the SMA material undergoing a transformation from its austenitic phase to its

martensitic phase, and then back to its austenitic phase. Under very high forces, the dimensional change may not be totally reversible and the SMA material may be permanently deformed to some degree. Again, the "superelastic effect" is the typical technical terminology used by metallurgists to distinguish this "superelastic" property of SMAs from their "shape memory effect".

The SMA Reference, a full translation of which is enclosed herewith, involves making use of only the "shape memory effect" (SME) described above, and NOT the "superelastic effect" (SE) that the presently claimed subject matter involves. In the SMA Reference, an electronic parts joining material is formed that is alleged to help reduce conductivity failures between two electronic components or circuit elements, as a result of experiencing a heat cycle. Specifically, this reference discusses using conductive SMA particles in an insulating resin base material. There is no discussion of the potential benefits of using SMA particles in a paint or coating. Furthermore, there is no discussion in this reference of using SMA particles for their "superelastic" quality, let alone of using the superelastic quality provided by SMA particles to improve the compression-after-impact (CAI) strength (i.e., toughness) of a paint or coating. The particular reasons why the use of SMA particles would be desirable in a paint or coating would be to improve the toughness of the paint or coating in resisting impacts. The discussion in the SMA Reference is limited strictly to making use of the temperature responsiveness characteristics of SMA particles in the insulating resin (i.e., strictly to the SME effects of the SMA particles). This is so that when a heat cycle is encountered, and the resin volume expands, the SMA particles in the insulating resin begin a

reversion action that helps to maintain electrical conductivity between two electronic parts joined together via the resin based material (labeled as component 2 in Figure 1).

Furthermore, one of ordinary skill would not be looking to use the teachings of the SMA Reference (i.e., using SMA particles), whose functionality is entirely dependent on exploiting the "shape memory effect" of the SMA particles (which requires heating), with the material used in Paine et al, since Paine et al is clearly exploiting the "superelastic effect" and high strain-to-failure property of the SMA, which never requires a temperature change for its functionality and effectiveness.

Thus, there is nothing in the SMA Reference that would alert or suggest to one of ordinary skill in the art the desirability of using the austenitic and martensitic properties of SMA particles in a paint or coating to toughen the paint or coating against impacts. To the contrary, the SMA Reference is completely silent on the benefit of using SMA particles to toughen other types of compounds such as paints or protective coatings.

Thus, the following holds true when viewing the teachings of Paine et al. and of the SMA Reference:

1. Paine et al. discloses nothing that would suggest the desirability, or otherwise motivation one of ordinary skill in the art, to use SMA material in particle form in a paint or protective coating;

2. Paine et al. is not even concerned with compounds such as paints or protective coatings, and definitely does not disclose or suggest using SMA particles in paints or protective coatings;

The structure of Paine et al. would most likely be degraded in strength if SMA particles were used instead of continuous SMA fibers, in the multi-layer stack of polymer plys that are disclosed in Paine et al; thus, if anything, Paine et al. teaches away from using SMA material in particle form;

3. The "SMA" Reference does not suggest in anyway using the superelastic qualities of SMA particles in a paint or a protective coating, but rather only discusses using the "shape memory" effect of SMA particles in an insulating base material to maintain conductivity as the volume of the base material increases during a heat cycle.

Again, the Examiner appears to be completely disregarding the important fact that there is simply no motivation or desirability apparent from the Paine et al. and/or SMA Reference that would lead one of ordinary skill in the art to recognize the desirability of using the unique superelastic quality of SMA particles in a paint or protective coating. The desirability of such a combination only becomes apparent after reading the present application.

In view of the foregoing, reconsideration of the rejection of Claims 1-3, 5-8, 10-17, 19-30, 33-35 is respectfully requested.

In view of the foregoing remarks concerning the SMA Reference and the Paine et al. reference, it is believed that the rejection of Claims 4, 18, 30, 31, 32, 9 and 36 in view of SMA Reference/Paine et al./Chiou et al. has been rendered moot.

Thus, reconsideration and allowance of all of the pending claims of the present application is respectfully requested.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: August 30, 2006

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